

427-3.



STEAM
AND
HOT WATER
BOILERS

INTERNATIONAL
HEATER CO.



427-3.

Form 633-7M.-6-05.

A CATALOGUE OF STEAM BOILERS AND HOT WATER HEATERS

OUR BOILERS

Are produced under the personal supervision of expert workmen and every boiler is tested before leaving the factory 🍀 🍀 🍀 🍀 🍀 🍀

We take no contracts for the installation of apparatus. Our market is with the trade only 🍀 🍀

We make no piping plans or working drawings. We are manufacturers, not contractors 🍀 🍀

Our boiler price lists, containing full information relative to prices, ratings, terms, etc., will be sent to the Trade upon application 🍀 🍀 🍀 🍀

*N. H. RAND.
1321 ARCH STREET,
PHILADELPHIA, PA.*

INTERNATIONAL HEATER COMPANY

GENERAL OFFICES, UTICA, N. Y.

NEW YORK
Metropolitan Building
No. 1 Madison Ave.

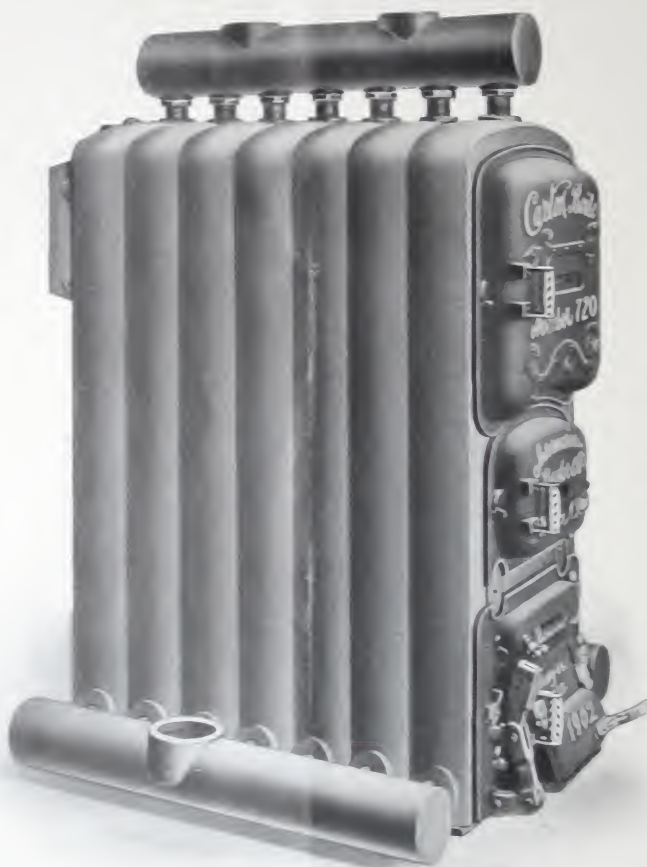
BOSTON
Cor. 5th & Spruce Sts.
CHELSEA

CHICAGO
43 Dearborn Street

Northwestern
Agency

ENGINEERING & STEAM SUPPLIES CO.

Minneapolis
Minnesota



CARTON HOT WATER BOILER

20-INCH GRATE EXTERIOR VIEW

See Pages 30 and 31 for Dimensions and Capacities

Carton Sectional Steam and Water Boilers



MASONIC TEMPLE, HARLAN, IA.

UR CLAIMS. Efficiency of heating surface; Perfect combustion; Largest practicable fire surface; Proper ratio of grate surface to boiler surface; Vertical circulation; High temperature of gases in flues; Ease of access for cleaning; Ease of management, and superior mechanical construction.

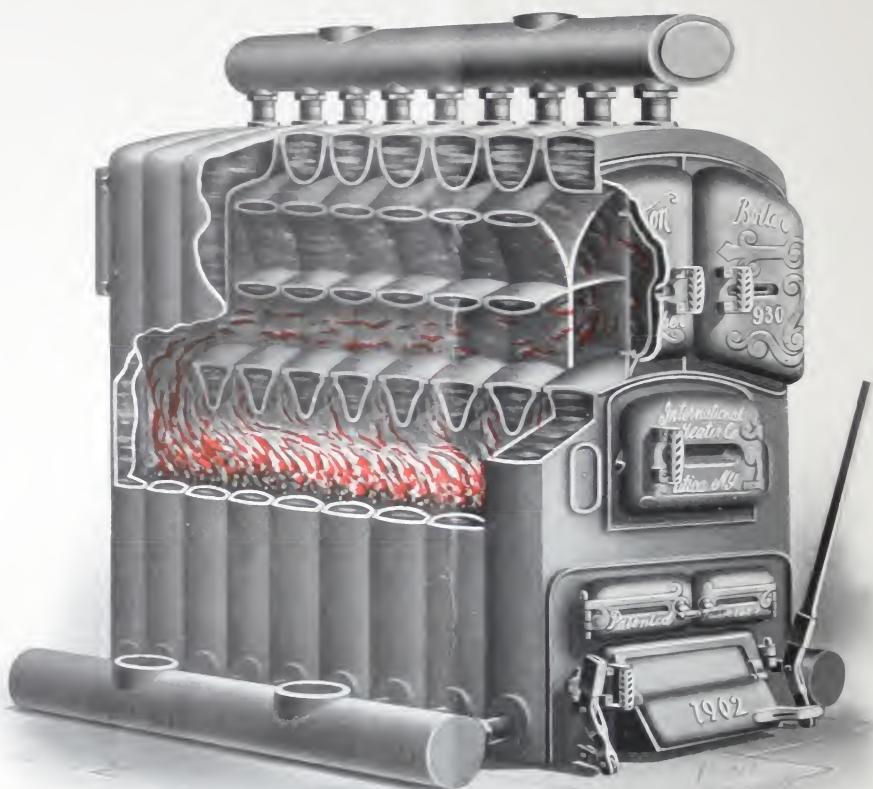
A Conceded Fact

In the construction of these boilers we have not considered expense, and our efforts have resulted in producing boilers with more positive and effective surface than can be found in other forms of cast iron sectional boilers. The test on steam boilers of this construction, as shown on pages 13 and 15, applies also to the water boilers, their construction being the same.

An evaporation of "11.02 pounds of water per pound of combustible" is unsurpassed. It will also be noticed in this test that the temperature of the gases of combustion entering the chimney flue ranges from three to twenty-one degrees only above the temperature of the steam, proving our emphatic claim that these boilers utilize about all the available heat from the fuel. This is not an exaggerated claim, nor one difficult of proof.

The Ash Pits

Of these boilers are surrounded by water as the water-legs of the fire box extend down to the floor line, and by this construction the heat given off at the bottom of the grates and from the heated ashes is absorbed. The water does not return into the boiler above the grate line but is connected into the water legs at the bottom of ash pit where the water is cooler. Ample room is provided under the grates, but any desired depth of ash pit may be had by constructing a brick ash pit below bottom of water legs. The sections stand on bed plates provided for that purpose. This insures a good level foundation for the heater, bringing the nipples true to the drum tappings and requiring but a short time to set up the heater.



CARTON HOT WATER BOILER

30-INCH GRATE CUT AWAY VIEW

See Pages 30 and 31 for Dimensions and Capacities



FT. SCHUYLER CLUB, UTICA, N. Y.

THE FEED AND FLUE DOORS. The improved feed and flue door frames, which bolt to the water front are provided with heavy flanges over which the doors close perfectly tight. The doors are constructed with openings in the center and are lined with extra heavy plates, affording ample air space between the doors and linings proper. The purpose of this construction is not only to protect the doors but to admit super-heated air for the complete combustion of the gases. It virtually forms a **HOT BLAST DRAFT**, which adds materially to the efficiency of the boilers. The flue doors are very large, and when open easy access is given to all the flues for convenience in cleaning, which can be done under any condition of the fire and in a few moments' time.

The Fire Box

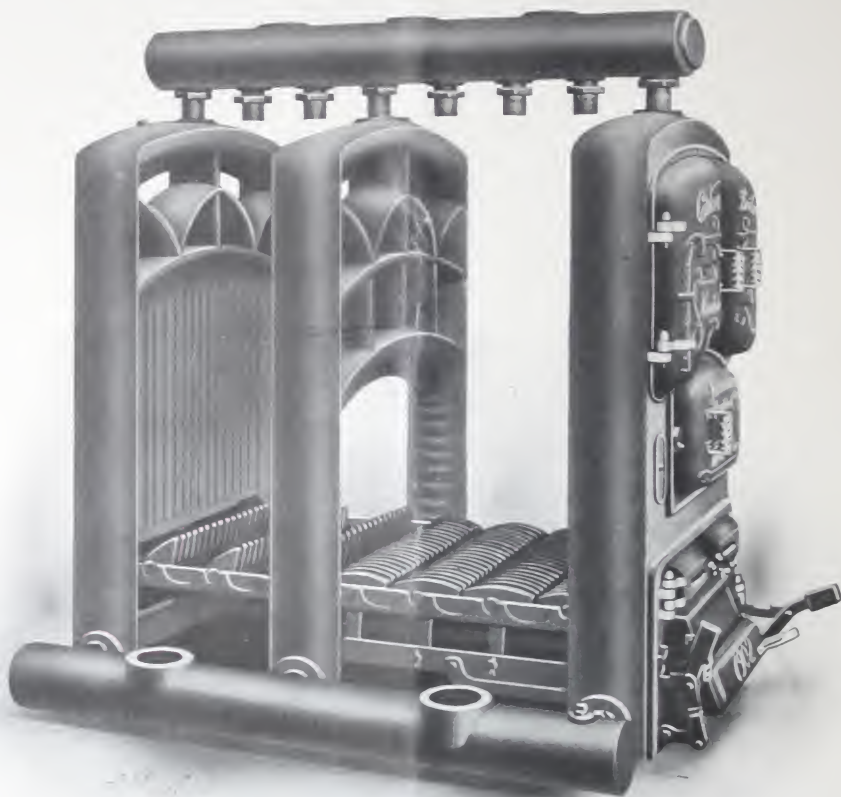
The sides and back of fire box are double corrugated, which adds greatly to the direct fire surface, gives greater strength to the castings and insures perfect combustion on all sides of the fire box.

The Crown Sheet

Is constructed with a series of drop V-shaped corrugations arched at the center so they drain at either side. These V-shaped corrugations are 6 inches in depth and 6 inches apart in the 20-inch grate series, and 8 inches in depth and 8 inches apart in the 30 and 40 inch grate series. They not only add strength to the water-legs but lengthen the direct fire surface, making a most effective crown sheet. The water in these V-shaped corrugations absorbs the heat very rapidly causing an immediate circulation in the vertical water-ways forming the top of these corrugations. It is surprising how quickly steam will generate in these heaters; when the draft is put on the effect seems instantaneous. There is no overshadowed surface on this crown sheet.

The Combustion Travel

The fire current is carried to the flue in the back of the combustion chamber, thence to the front of the boiler, and returning again to the back of the boiler through the six top flues before entering the smoke box. This maintains a fire travel in the boiler three times its entire length and at the same time there is no condensation of the flue gases to a degree where they become detrimental—a point of merit which is peculiar to these boilers. Perfect combustion is easily obtained with a moderate fire.



CARTON HOT WATER BOILER

30-INCH GRATE SET UP VIEW

See Pages 30 and 31 for Dimensions and Capacities



BAPTIST CHURCH DU QUOIN, ILL.

VERTICAL CIRCULATION. By the illustration on the opposite page showing the set up view, it will be readily seen that the water circulation in these boilers is all vertical and positive. This circulation through vertical water-ways direct from the crown sheet is very rapid, while the outward curve of these water-ways toward the outer surface of the heater establishes an internal circulation that enables an even water line

to be maintained under heavy firing.

This is a very important feature since an exceptionally large percentage of the boiler is direct fire surface—transmitting its heat to the water with great rapidity.

Lock-Nut Nipple Connections

Each section is a separate and independent boiler. There are no internal connections; no gaskets or packed joints.

All connections are on the outside of the heater away from the fire or gases. The flow and return headers are connected to the heater by 2-inch extra heavy lock-nut nipples in the 20-inch grate series, and 2½-inch in the 30 and 40-inch series, upon one end of which is cut a standard taper thread and upon the other end is cut a straight or running thread which is made up with the lock-nut packed with asbestos wicking and red lead.

The Sections

As will be noticed by the illustrations, are very strong; the ovaled form of the curved arched water-ways give great strength to the castings. The water back section is heavily corrugated on its flat surfaces and well stayed within the water-way.

Heights of Boilers

In constructing these boilers special attention has been given to their height, and they are made as low as is consistent with the vital requisites—proper depth of ash pit and fire pot, and generous spaces for combustion and flue travel. A long experience has taught us that in boilers the gases should be allowed to rise freely from the combustion chamber, maintaining their original high temperature, instead of being at once reverted into low flues near to the base of heater to be more or less quickly condensed, to a lower temperature.



CARTON HOT WATER BOILER

4-INCH GRATE EXTERIOR VIEW

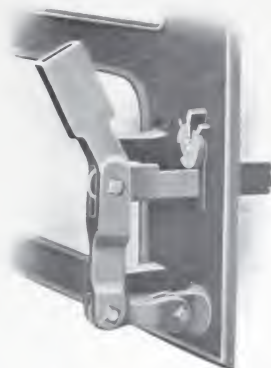
See Pages 30 and 31 for Dimensions and Capacities



SAVINGS BANK, UTICA, N. Y.

operated with one lever handle, and in the 30 and 40 inch series with two; the front bars are operated with one and the back bars by the other. They operate very easily and all ashes and clinkers are readily removed from the grate surface without disturbing or packing the fuel too tightly, and thereby preventing good combustion. By an ingenious arrangement, which is bolted to

the front of the boilers directly over the levers called a



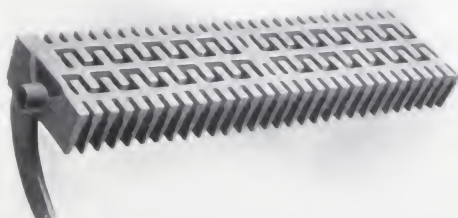
Grate Stop

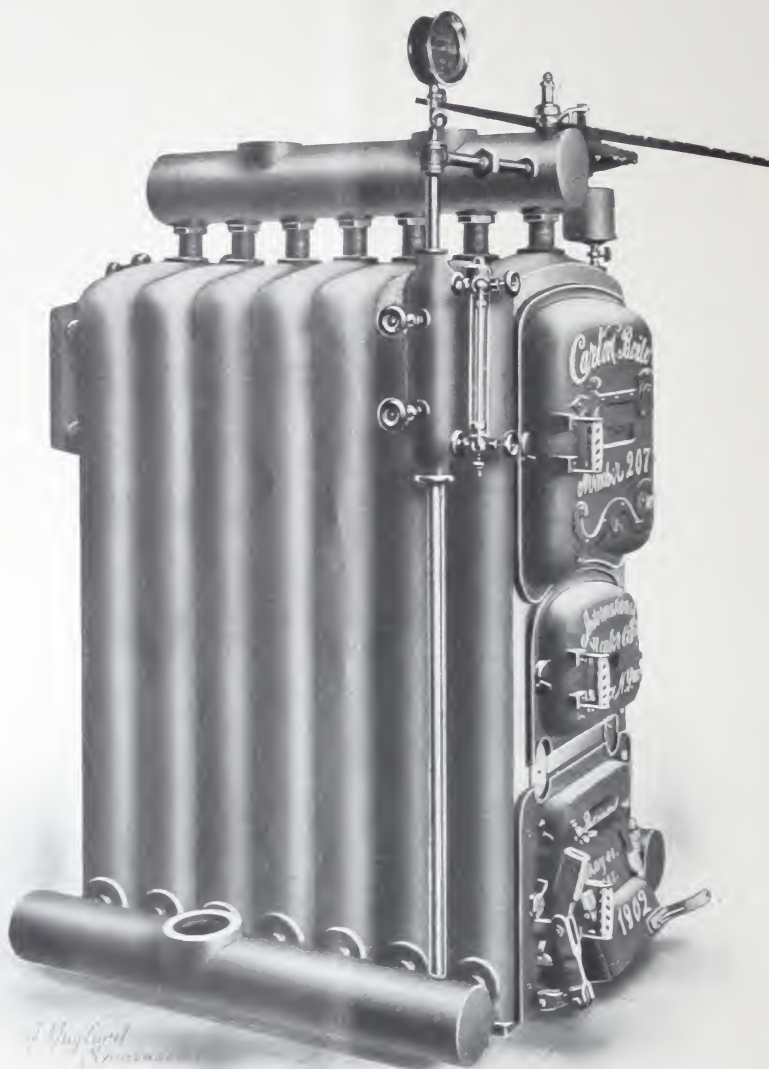
The grate bars can be agitated without danger

of dumping, but if for any reason it is found necessary to dump the fire the grate bars can be turned to nearly a perpendicular position by simply turning the "stop" whereby the levers are drawn out their entire length.

The Improved Grate Frame

Is so constructed that the entire frame and bars can be drawn out through the ash pit opening. In case of changing from the regular to the pea coal grates or vice versa, or in replacing one or more bars, this will be found a great improvement. The same grate frame is used for either the regular or pea coal grate.





CARTON STEAM BOILER

20-INCH GRATE EXTERIOR VIEW

See pages 30 and 31 for Dimensions and Capacities



CATHOLIC CHURCH
SOMERSWORTH, N. H.

LINKER DOORS. These doors open on a level with the top of grate its entire width, and through them the complete grate surface may be reached with a slice bar provided for that purpose. This is a great convenience in cutting or agitating the fire, especially when low grade fuels are used.

Openings for Coils

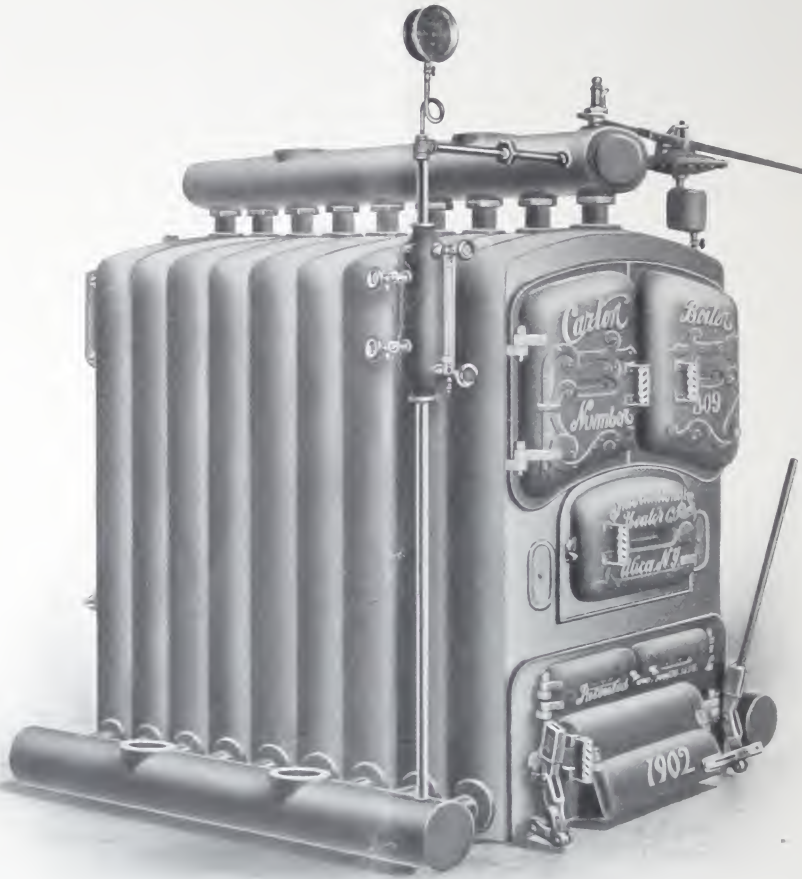
Are provided in all these boilers located on either side of feed door as shown on illustration. These openings through which coil pipes can be inserted are closed by plates securely bolted to the lugs cast on the inside of the water front sections. These plates are easily removed and replaced.

Bridge Wall Sections

These boilers are made with and without bridge walls, and full information regarding their location in the different sizes and series may be found on page 30.

Finally

In the construction of these boilers we have not lost sight of keeping the proper ratio of grate to boiler surface, which is an important feature and one that has been carefully considered. These boilers require no brickwork; the combustion chambers are large and ash pits ample. The direct fire surface is remarkably large and efficient. The upright water-ways, leading directly from the crown sheet, insure an absolutely vertical circulation. These boilers are free from joints, easy to clean, perfect in workmanship and operation, and they are very attractive, being beautifully designed and proportioned.



CARTON STEAM BOILER

30 INCH GRATE EXTERIOR VIEW

See Pages 30 and 31 for Dimensions and Capacities

What William J. Baldwin, M. E.: says:--

11.02 Pounds of Water Evaporated per Pound of Combustible

277 Pearl Street, New York, October 15, 1894.

THE CARTON FURNACE COMPANY,

Nos. 187 and 189 Genesee Street,

Utica, N. Y.

Gentlemen:—Agreeable to your request I have made the usual duty trial on your No. 4 Steam Boiler, and respectfully report as follows:

The trials were made at a steam pressure of five (5) pounds, and cold water was fed into the boiler at a temperature of 52° Fah.

The temperature of the flue gases as they passed through a short smoke pipe ranged from 230° Fah. to 248° Fah. during the trials.

The evaporation of water from 52° Fah. to 5 pounds pressure of steam was 9.32 pounds of water per pound of dry coal.

The evaporation per pound of combustible—the ashes and clinkers having been weighed back—was 10.07 pounds of water from 52° Fah. to 5 pounds pressure of steam.

The equivalent evaporation per pound of coal from water at 212° Fah. to 5 pounds pressure of steam is 10.2 pounds of water. The equivalent evaporation, therefore, from the temperature of the return water, in a gravity apparatus to low pressure steam, is approximately 10 pounds of water per pound of coal.

The equivalent evaporation per pound of combustible from water at 212° Fah. to 5 pounds pressure of steam is 11.02 pounds of water.

The amount of coal burned per square foot of grate per hour was 5.14 pounds.

The amount of combustible burned per square foot of grate per hour was 4.76 pounds.

Note Low Temperature of Flue Gases (230°) in Smoke Pipe



CARTON STEAM BOILER

40 INCH GRATE EXTERIOR VIEW

See Pages 30 and 31 for Dimensions and Capacities



*29 x 56
34 x 46
See
61" Water Line
8976 lbs weight
Heavy plate*

We Rate Our Boilers Lower Than Mr. Baldwin's Test

Read the last two paragraphs of this letter

The amount of water evaporated from 52° Fah. to 5 pounds steam pressure, per square foot of average boiler surface, per hour, was 2.17 pounds.

The equivalent evaporation of water from 212° Fah. to 5 pounds steam pressure, per square foot of average boiler surface, per hour, is 2.368 pounds of water.

Calorimeter tests of the quality of the steam were made from time to time, which showed that the steam was practically at maximum density; or, in other words, the steam was dry.

The rating of the No. 4 boiler above described and tested is 640 square feet of radiation, for house heating by steam when the pressure is low (say 1 to 5 pounds). The above calculation of heating surface is based on the use of 5 pounds of coal per square foot of grate, and forms the maximum condition for a house heating boiler.

You will note that when the rate of combustion is equal to 5 pounds of good anthracite coal per square foot of grate per hour, one square foot of average boiler surface evaporated sufficient steam for 10 square feet average radiation—an exceedingly high efficiency and rarely obtained in practice.

The low temperature at which the gases of combustion entered the chimney, ranging from 3 to 21 degrees above the temperature of steam, shows that the boiler utilizes about all the available heat of the fuel.

Respectfully submitted,

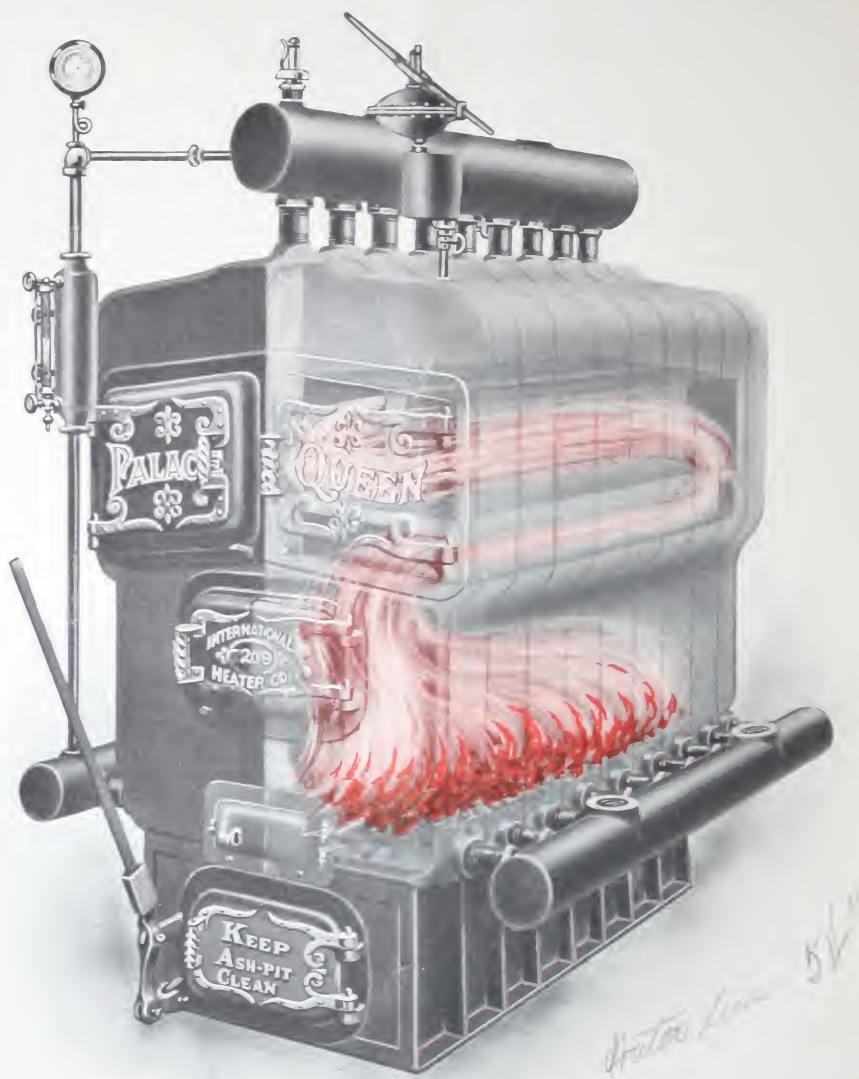
WILLIAM J. BALDWIN.

The best designed boilers, well set, with good draft and skillful firing, will evaporate from 7 to 10 pounds of water per pound of first-class coal. The average result is from 25 to 60 per cent. below this.

Note.—The Boiler referred to in Mr. Baldwin's letter is now No. 204

Unqualified Commendation

**From an Authoritative and Disinterested Source of the Remarkable Efficiency
of the Carter Boilers**



PALACE QUEEN STEAM BOILER

20 INCH GRATE TRANSPARENT VIEW

See Page 32 for Dimensions and Capacities

The Palace Queen Sectional Boiler

For Steam and Water



HOTEL BRUNTON.
WALL LAKE, ILL.

LIGHTLY differs in form of construction from the Carton Sectional Boiler and stands lower in height.

It is not made in as large capacities or in as many different widths of grates, but it is a boiler of great efficiency and durability, and is in every particular a strictly high grade heater with all the modern ideas embodied in its construction.

The Ash Pit

Of this boiler is made entirely separate from the sections and is constructed with heavy flanges on which the sections are placed. The ash-pit door for the removal of ashes is very large. The draft door, which is of the improved center balanced pattern, is located at the rear end of the ash-pit. This insures perfect combustion at the back of the fire box.

The Grates

Are of the Wheeler independent triangular bar pattern—very heavy and easily operated by one lever. The slightest effort clears the fire from ashes and clinkers. The Grate Frame is readily removed by drawing it out through the ash-pit opening at the front.

The Sections and Fire Travel

The sections of this boiler are so constructed as to form a very deep fire box. The fire travel is exceptionally long, being three times the length of the heater. The combustion is drawn to the front, thence to the back through the two lower outside flues, then returning to the front, through the two top outside flues and to the rear again through the top center flue. Thus it may be seen that the available heat is utilized and thoroughly absorbed by the water and that the combustion reaches the smoke exit at a very low temperature.

Circulation is Perfect

Vertical circulation and horizontal fire travel, two very important essentials, are prominent features of this boiler. The circulation in EACH SECTION is perfect. The vertical water-ways are large, thereby insuring positive, rapid and continuous circulation with little or no friction to overcome.



PALACE QUEEN WATER BOILER

20-INCH GRATE EXTERIOR VIEW

See Page 32 for Dimensions and Capacities



BUNNS SCHOOL, SPRINGFIELD, ILL.

excavating for the ash-pit.

LOW BOILER. For a sectional boiler with a header the **PALACE QUEEN** stands very low. As shown in the illustrations the width of this boiler is increased above the fire box, which enables the boiler to stand lower without detracting from the requisite amount of flue and fire surface. In a shallow cellar or basement it is particularly advantageous to use this boiler as it frequently obviates the necessity of

Lock-Nut Nipple Connections

Are used in this boiler throughout. The return drums are located above the separate base or ash-pit, thereby making the assembling and connecting of this boiler very easy and convenient. Each section works and is connected separately, and in case of mishap in extreme weather any one or more sections can be disconnected and the headers plugged, thereby obviating the danger of being without heat while awaiting repairs.

The lock-nut nipples used are of the standard taper thread and the only packing used about the boiler is the asbestos wicking around the inside of the lock-nut. There is not the slightest danger of leaking as the connections are absolutely and permanently tight.

A Clinker Door

Is located on a level with the top of grate through which the entire grate surface or any part of the fire box may be reached.

Coil Openings

All Palace Queen boilers are made with openings for coils which are located at the rear end of fire box and not shown by the illustrations.

Not a Weak Point

Can be found in the make-up of this boiler. **IT IS ECONOMICAL**—there is no dead or inoperative surface. **IT IS DURABLE**—All parts are heavy and strong. **IT IS SAFE**—each boiler thoroughly inspected and tested before leaving our factory.

WITH THE COMBINED ELEMENTS OF

Economy, Safety and Durability we can add Efficiency

AS APPLICABLE TO THE PALACE QUEEN BOILER.

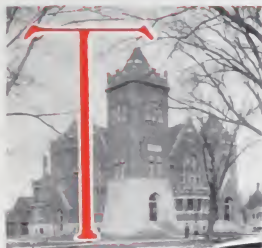


PALACE KING WATER BOILER

EXTERIOR VIEW

See Page 32 for Dimensions and Capacities

The Palace King Hot Water Boiler



M. E. CHURCH, FAIRBURY, IA.

THIS Heater is made for water only. The four smaller sizes are made with push-nipple connections and the six larger sizes, commencing with No. 25, are made with the **IMPROVED LOCK-NUT OR UNION CONNECTIONS**. All connections are entirely outside the boiler, and no gaskets or rubber packings are required to make them tight. The capacities of this boiler range from 400 to 1900 square feet of direct radiation.

The Ash Pits

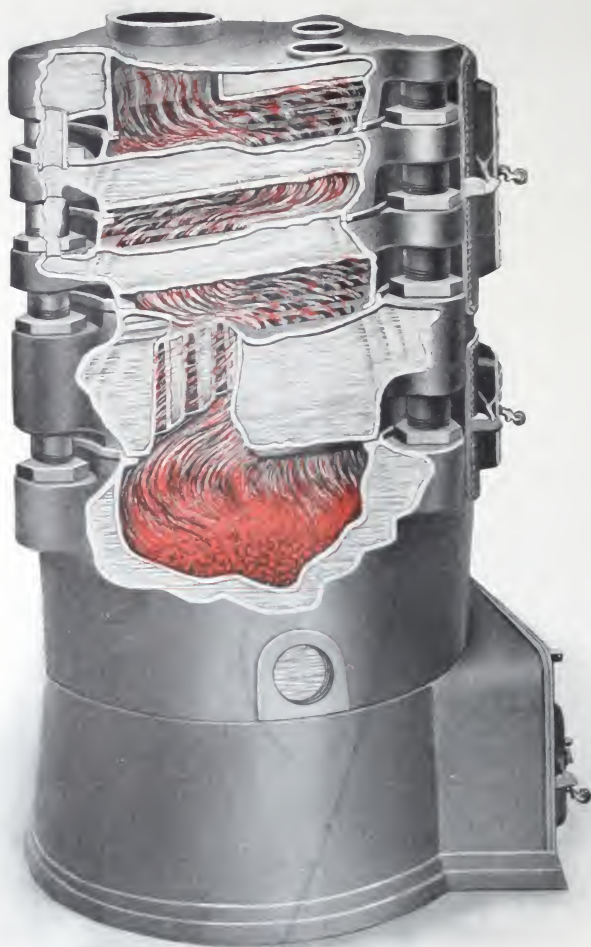
Of these boilers are exceptionally commodious and are fitted with large doors, with the improved balanced draft door, hinged in the center.

The Grates

Used in the smaller sizes are of the "Long Patent" which are easily agitated and can be dumped entirely over without interference with the shovel while ashes are being removed. All the larger sizes are fitted with an extra heavy triangular grate with two shake bars, enabling it to be operated in sections if desired, which insures economy.

The Fire Travel

By the illustration on the next page the long fire travel may be readily traced. The combustion and gases first pass to the front and then rise in an unbroken current through the crown sheet section, then to the rear, rise again, and so alternating from front to rear, until the smoke exit is reached. Thus it will be seen that the heat from the fuel is entirely utilized.



PALACE KING WATER BOILER

CUT AWAY VIEW

See Page 32 for Dimensions and Capacities



RESIDENCE,
CRAWFORDSVILLE, IND.

THE WATERWAYS. From the level of the grate to the extreme top, this heater, including every section, is filled with water, and one of the strong points, and one to which we call particular attention is the inclined water-ways and horizontal surface as shown in illustration, by which, beginning with the crown sheet directly over the fire, the circulation is greatly facilitated. These inclined water-ways insure rapid circulation and economy in the transmission of heat.

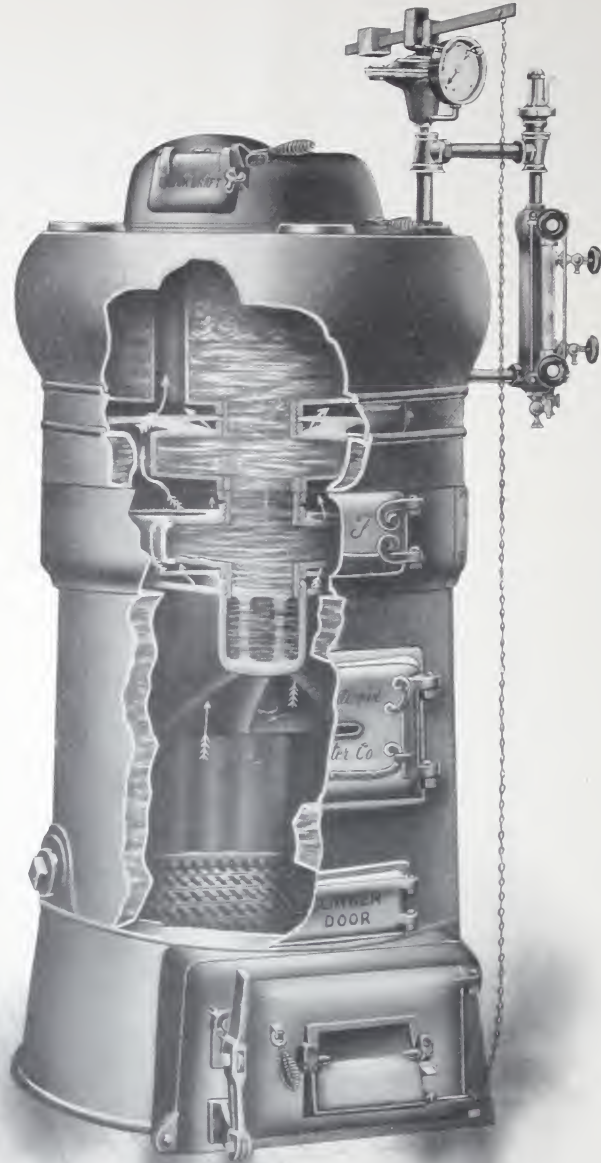
Combustion

The hot gases, which perhaps constitute the most valuable portion of the fuel, and in some constructions are wholly or largely lost through the smoke flue, are entirely utilized in the PALACE KING. Through the feed door a constant supply of oxygen is admitted in a steady current, by which the gases are thoroughly ignited before ascending through the upper sections.

ANOTHER POINT.—If in mild weather a slow fire be maintained the water in the crown sheet directly over the fire will circulate through the water-legs without reference to the other sections. This means in fall and spring weather a light fire, slow circulation, moderate heat and economy.

Durability

It is certainly made to endure—cannot be made stronger or better calculated to last. Each boiler is mounted complete and tested under heavy pressure before shipment is made. It is easily erected, easily operated and easily cleaned. It is also a very sightly boiler in appearance.



INTERNATIONAL STEAM BOILER

"F" SERIES CUT AWAY VIEW

See Page 32 for Dimensions and Capacities

International "J" Series Boiler

For Steam and Water



TWELVE FLAT BUILDING
KANSAS CITY, MO.

HERE is a rapidly increasing demand for a round boiler which this series is intended to fill. They are made in eleven sizes for steam, with capacities from 225 to 1200 square feet, and for water in ten sizes, with capacities ranging from 500 to 2,000 square feet.

The Ash Pits

Of these boilers are deep and furnished with a commodious and convenient door for the removal of ashes. The draft door is of modern design and hinged in the center.

The Rocking and Dumping Grate

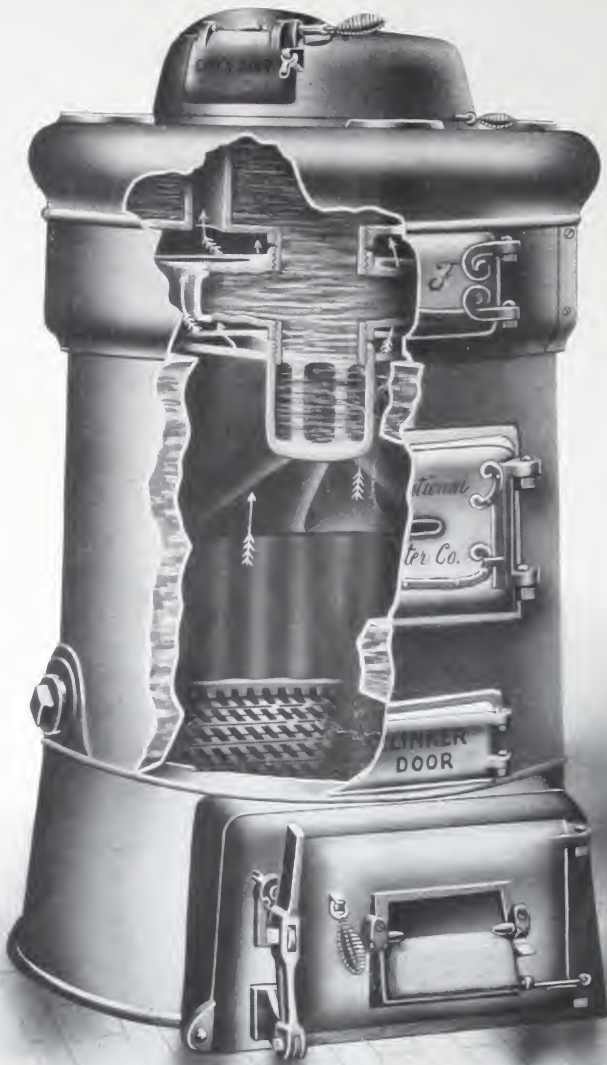
Is so constructed that the grate ring is entirely eliminated. The grate bars are hung in the base and can be easily removed or replaced through either the ash-pit or feed doors. The bars are attached to the shaker lever by means of keys or cotters that are easy of access through the ash-pit door. The slightest effort agitates the grates and if it is desired to dump the fire it is quickly done by turning the "grate stop," (see cuts on page 9), allowing the connecting rod to be drawn out so that the grate bars stand in a vertical position, immediately freeing themselves from all accumulations. A clinker door is provided through which the entire surface of grate may be reached.

The Fire Pot

Which is of unusual depth is deeply corrugated, thereby adding materially to the fire surface of boiler. Perfect and rapid circulation within the boiler is assured by means of the radial arms which form a part of the fire pot and are directly over the fire in the form of a column, containing a considerable quantity of water.

Water-ways

There is no dead or ineffective surface in this boiler. The water-ways surround the fire, are above the fire, are in the midst of the fire, and so distributed that rapid and thorough absorption of the heat is positively assured. The sections above the fire pot are connected by means of lathe turned screw-nipples in the center, these nipples being made of same material as the boiler. This permits of expansion of the sections from the center outward, thereby obviating all liability of strain or breaking of the sections. In the construction of the radial arms, extending from the center to the outside, we have all the advantages of drop tube surface (one of the most efficient types of heating surface known) with the one objection to that construction removed,—in that the radial arms allow for drainage.



INTERNATIONAL WATER BOILER

"F" SERIES CUT AWAY VIEW

See Page 32 for Dimensions and Capacities



LONGFELLOW SCHOOL
FALL RIVER, MASS.

THE FIRE TRAVEL. The combustion and gases not only pass through the interior flues but are forced to impinge upon the sides of the boiler proper, before reaching the upper sections, thereby rendering the entire combustion chamber valuable fire surface. After the gases leave the fire pot section they pass through the intermediate section (or sections) into the dome section, upon which is placed

A CIRCULAR BAFFLE PLATE, which is easily adjusted and by means of which the draft is largely controlled. This baffle plate, or damper, is so arranged that the flues in the dome may be entirely open, partially opened or nearly closed. The large smoke hood which is fitted to the dome, directly over the baffle plate, is equipped with a checkdraft door for further controlling the draft.



Attractive Design

This boiler is of modern design; neat and attractive in appearance. The castings are very smooth and well mounted. The cast-iron jacket ring surrounding the flue sections is made up of several sections bolted together, in which are placed clean-out doors, front and rear, for the easy removal of the soot from such portions of the boiler as are not self-cleaning.

The Durability

Of this boiler cannot be questioned. The walls of the water-ways are of even thickness and the castings are produced from the strongest iron mixture. There are no weak points. Each boiler is set up complete, examined and thoroughly tested before shipment is made.

Efficiency

The heating trade will quickly recognize that in this construction we have a boiler which is compact and easily erected, and one that possesses all the combined elements that go to make up an efficient, safe and desirable heater, and, where a boiler of moderate capacity is required, one that is sure to satisfy the most exacting.



INTERNATIONAL WATER BOILER

"F" SERIES EXTERIOR VIEW

See Page 32 for Dimensions and Capacities

International "G" Series Tank Heater and Hot Water Boiler



These boilers are particularly adapted for heating cottages, small stores, private barns, railroad stations, houses, conservatories, small greenhouses, poultry houses and church baptisteries and for furnishing large quantities of hot water for dwellings, hotels, apartment buildings, baths, barber shops, etc.

The General Construction

And arrangement of the heating surface is such as to give the greatest degree of efficiency with relative economy in fuel, simplicity and durability, and for the use of hard or soft coal, coke or gas fuel. Its construction throughout is of the highest grade of cast iron. The heater is made up of few parts, carefully fitted and threaded and will assemble perfectly.

The Fire Pot Section

Is corrugated, very largely increasing the surface, and of unusual depth, permitting slow and thorough combustion at the center and outer edges, and not necessitating often replenishing with fuel. The large center water column is a part of the fire pot section and connected with the sides of this section by radial arms, which allows for perfectly draining the heater, and this surface overhangs the fire in a most effective manner. The section being conical in form, the direct rays of heat impinge on every inch of the heating surface, making it very effective.

The Smoke Hood

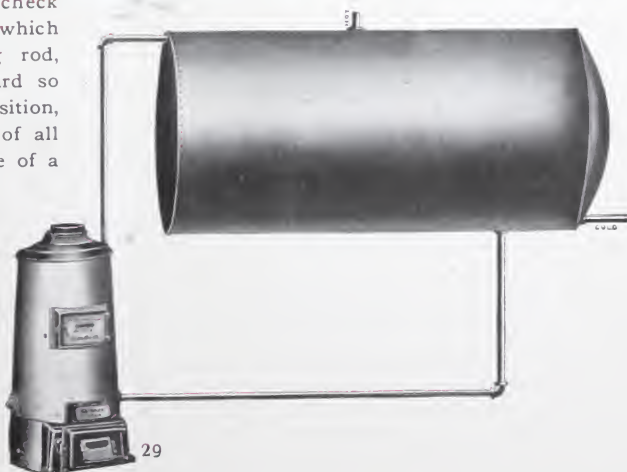
Economizes in the height of the boiler and is very compact. When the dome section is used, a circular sliding baffle plate is provided in the hood for the purpose of regulating the draft through the flues of the dome section.

The Rocking and Dumping Grate

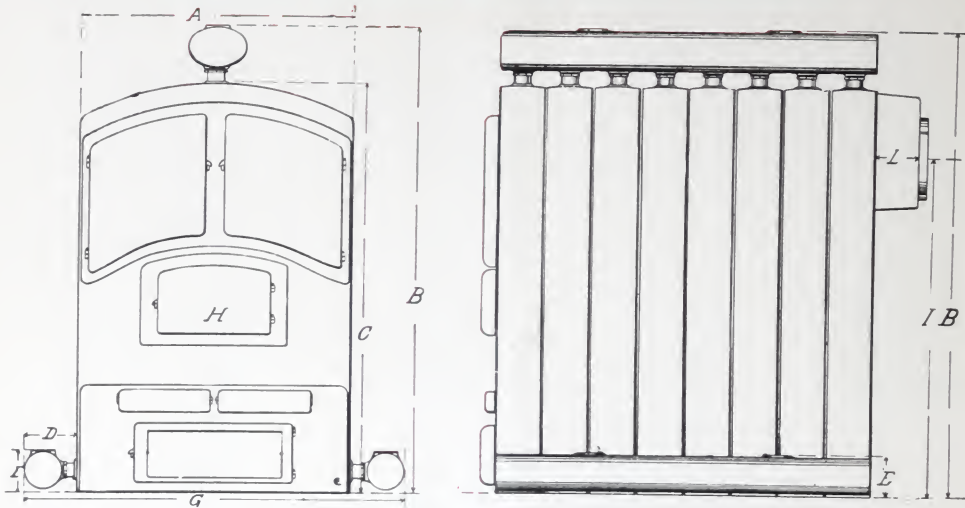
To dump the fire a swinging check is provided, one-quarter turn of which releases the grate connecting rod, allowing it to be drawn forward so the grates stand in a vertical position, clearing themselves perfectly of all accumulations, without the use of a poker.

Is simple in construction. The base itself is the holder and supporter of the bars.

Capacities
See page 32



Outline Drawings---Carton Boilers



Carton Boiler Measurements

For convenience in erecting, the following measurements are given, corresponding to the distance between points indicated on the outline drawing above.

	20-inch Grate	30-inch Grate	40-inch Grate
A	26 inches	38 inches	48 inches
B	70 "	73 "	82 "
C	61 "	63½ "	72 "
D	8½ "	9 "	10 "

	20-inch Grate	30-inch Grate	40-inch Grate
E	6¾ inches	7 inches	7¼ inches
G	42 "	56 "	67 "
H	10x14½ "	11x17 "	12x20 "
I	50¾ "	54½ "	59 "
L	6 "	6 "	7 "

FOR FURTHER DATA, giving height of water line, depth of sections, area of grate, diameter of smoke pipe, supply and return tapplings, etc., see opposite page.

Location of Bridge Walls in Carton Boilers

20-IN. GRATES.

Have none.

30-IN. GRATES.

Nos. 305, 306, 307, 308 and 309, 530, 630, 730, 830 and 930 have none.

Nos. 3010 and 1030 have one.

40-IN. GRATES.

Nos. 407, 408, 409 and 740, 840 and 940 have none.

Nos. 4010 and 1040 have one.

Nos. 4011 and 1140 have one intermediate section between back and bridge wall sections.

Nos. 4012 and 1240 have two intermediate sections between back and bridge wall sections.

Explanatory

RATINGS. Our ratings, as given on the following pages, provide that all piping (mains and risers, flows and returns) be figured as radiating surface, in addition to the direct cast iron radiation to be used. When pipe coils are used, instead of cast iron radiation, select a boiler with 25 per cent. greater rated capacity. When indirect radiation is used, figure not less than 50 per cent. increase over direct radiation in determining size of boiler required, and 25 per cent. increase for direct indirect radiation.

Ratings are based on the assumption that there shall be used sufficient radiation to properly heat the building, the piping of sufficient size and properly run, and the boiler connected to a flue of ample capacity, with steam at 2 lbs. pressure as it leaves the boiler, or in case of a water boiler with the water at 180 degrees Fahrenheit, as it leaves the boiler. **WHEN SOFT COAL IS USED A BOILER OF LARGER SIZE SHOULD BE SELECTED.** When a pipe coil or cast iron section is introduced into the fire pot for the purpose of heating water for domestic use, additional capacity should be figured in determining size of boiler at the rate 1½ sq. ft. direct radiation for a steam boiler or 2 sq. ft. of direct radiation for a water boiler for each gallon of water to be heated per hour.

Dimensions and Capacities

Carton Boilers

CARTON 20-IN. GRATE, STEAM BOILERS

55" x 82"

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Diameter of Smoke Pipe	TAPPINGS	
							Supply Drum	Return Drums
							Top of Drum	Total Top Both Drums
204	0204	450	4	31	20x17½	8	2-2½ in.	2-2½ in.
205	0205	600	5	37	20x23½	8	2-3	2-3
206	0206	750	6	43	20x29½	10	2-3½	2-3½
207	0207	900	7	49	20x35½	10	2-3½	2-3½
208	0208	1050	8	55	20x41½	12	2-4	2-4

CARTON 20-IN. GRATE, HOT WATER BOILERS

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Diameter of Smoke Pipe	TAPPINGS	
							Supply Drum	Return Drums
							Top of Drum	Total Top Both Drums
420	0420	750	4	31	20x17½	8	2-2½ in.	2-2½ in.
520	0520	1000	5	37	20x23½	8	2-3	2-3
620	0620	1250	6	43	20x29½	10	2-3½	2-3½
720	0720	1500	7	49	20x35½	10	2-3½	2-3½
820	0820	1725	8	55	20x41½	12	2-4	2-4

CARTON 30-IN. GRATE, STEAM BOILERS

54" x 82"

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Size of Grate Omitting Bridge Wall	Diameter of Smoke Pipe	TAPPINGS	
								Supply Drum	Return Drums
								Top of Drum	Total Top Both Drums
305	0305	1300	5	49	30x31½	30x31½	12	2-4 in.	2-4 in.
306	0306	1625	6	57	30x39½	30x39½	12	2-4	2-4
307	0307	1950	7	65	30x47½	30x47½	12	3-4	3-4
308	0308	2275	8	73	30x55½	30x55½	14	3-4	3-4
309	0309	2600	9	81	30x63½	30x63½	14	2-5	2-5
3010	03010	2925	10	89	30x71½	30x71½	14	2-5	2-5

CARTON 30-IN. GRATE, HOT WATER BOILERS

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Size of Grate Omitting Bridge Wall	Diameter of Smoke Pipe	TAPPINGS	
								Supply Drum	Return Drums
								Top of Drum	Total Top Both Drums
530	0530	2150	5	49	30x31½	30x31½	12	2-4 in.	2-4 in.
630	0630	2675	6	57	30x39½	30x39½	12	2-4	2-4
730	0730	3225	7	65	30x47½	30x47½	12	3-4	3-4
830	0830	3750	8	73	30x55½	30x55½	14	3-4	3-4
930	0930	4300	9	81	30x63½	30x63½	14	2-5	2-5
1030	01030	4850	10	89	30x71½	30x71½	14	2-5	2-5

CARTON 40-IN. GRATE, STEAM BOILERS

60" x 82"

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Size of Grate Omitting Bridge Wall	Diameter of Smoke Pipe	TAPPINGS	
								Supply Drum	Return Drums
								Top of Drum	Total Top Both Drums
407	0407	2900	7	65	40x48	40x48	16	3-4 in.	3-4 in.
408	0408	3400	8	73	40x56	40x56	16	2-5	2-5
409	0409	3900	9	81	40x64	40x64	20	2-6	2-6
4010	04010	4400	10	89	40x72	40x72	20	2-6	2-6
4011	04011	4800	11	97	40x80	40x80	20	2-6	2-6
4012	04012	5200	12	105	40x88	40x88	20	3-6	3-6

CARTON 40-IN. GRATE HOT WATER BOILERS

No. with Regular Grates	No. with Pea Coal Grates	Capacity Direct Radiation	No. of Sections	Length over all	Size of Grate	Size of Grate Omitting Bridge Wall	Diameter of Smoke Pipe	TAPPINGS	
								Supply Drum	Return Drums
								Top of Drum	Total Top Both Drums
740	0740	4800	7	65	40x48	40x48	16	3-4 in.	3-4 in.
840	0840	5600	8	73	40x56	40x56	16	2-5	2-5
940	0940	6450	9	81	40x64	40x64	20	2-6	2-6
1040	01040	7250	10	89	40x72	40x72	20	2-6	2-6
1140	01140	7925	11	97	40x80	40x80	20	2-6	2-6
1240	01240	8575	12	105	40x88	40x88	20	3-6	3-6

Dimensions and Capacities

PALACE QUEEN 20-IN. GRATE, STEAMBOILERS

Number	Capacity Direct Radiation	Number of Sections	Length over all	Size of Grate	Diameter of Smoke Pipe	Supply Tappings	Return Tappings
205	550	5	43	20X22	10	2-2½ in.	2-2½ in.
206	700	6	49	20X28	10	2-3	4-2½ "
207	850	7	55	20X34	10	2-3½	4-3½ "
208	1000	8	61	20X40	10	2-4	4-3
209	1150	9	67	20X46	10	2-4	4-3

PALACE QUEEN 20-IN. GRATE WATER BOILERS

Number	Capacity Direct Radiations	Number of Sections	Length over all	Size of Grate	Diameter of Smoke Pipe	Supply Tappings	Return Tappings
520	900	5	39	20X22	10	2-2½ in.	2-2½ in.
620	1150	6	45	20X28	10	2-3	4-2½ "
720	1400	7	51	20X34	10	2-3½	4-3½ "
820	1650	8	57	20X40	10	2-4	4-3
920	1900	9	63	20X46	10	2-4	4-3

INTERNATIONAL "F" STEAM BOILERS

Number	Capacity Direct Radiation	Height from Floor to Top Outlet	Outside Diameter	Diameter Grate	Height Water Line	Size Smoke Pipe	Supply Tappings	Return Tappings
01	225	54	23	15	49	7	2-2 in.	2-2 in.
1	300	56	27	18	55	7	2-2½ "	2-2½ "
2	350	61	27	18	59	7	2-2½ "	2-2½ "
3	400	55	31	21	47	9	2-2½ "	2-2½ "
4	450	60	31	21	52	9	2-2½ "	2-2½ "
5	550	57	35	24	49	9	2-3	2-3
6	600	62	35	24	54	9	2-3	2-3
7	850	60	39	28	50	11	2-3½ "	2-3½ "
8	925	66	39	28	56	11	2-3½ "	2-3½ "
9	1100	63	46	32	53	11	2-4	2-4
11	1200	69	46	32	59	11	2-4	2-4

INTERNATIONAL "F" WATER BOILERS

Number	Capacity Direct Radiation	Height from Floor to Top Outlet	Outside Diameter	Diameter Grate	Size Smoke Pipe	Supply Tappings	Return Tappings
10	500	51	27	18	7	3-2 in.	3-2 in.
20	575	56	27	18	7	3-2 "	3-2 "
30	650	49	31	21	9	3-2½ "	3-2½ "
40	750	54	31	21	9	3-2½ "	3-2½ "
50	900	52	35	24	9	3-3	3-3
60	1000	56	35	24	9	3-3	3-3
70	1400	54	39	28	11	3-3½ "	3-3½ "
80	1525	59	39	28	11	3-3½ "	3-3½ "
90	1825	56	43	32	11	3-4	3-4
100	2000	62	43	32	11	3-4	3-4

PALACE KING HOT WATER BOILERS

Number	Capacity Direct Radiation	No. of Sections	Diameter of Fire Pot	Outside Diameter	Height	Diameter of Smoke Pipe	Supply Tappings	Return Tappings
18	400	4	18	24	45	7	2-2½ in.	2-2½ in.
180	500	5	18	24	49	7	2-2½ "	2-2½ "
22	650	4	22	28	47	8	2-2½ "	2-2½ "
220	750	5	22	28	51	8	2-2½ "	2-2½ "
25	900	4	27	34	50	8	2-3	2-3
250	1050	5	27	34	55	8	2-3	2-3
29	1250	4	31	38	50	9	2-3½ "	2-3½ "
290	1450	5	31	38	54	9	2-3½ "	2-3½ "
33	1700	4	35	42	57	10	2-4	2-4
330	1900	5	35	42	61	10	2-4	2-4

INTERNATIONAL "G" TANK HEATERS AND HOT WATER BOILERS

Number	Tank Capacity, Gallons	Capacity Direct Radiation	Height from Floor to Top Outlet	Outside Diameter	Diameter Grate	Size Smoke Pipe	Supply Tappings	Return Tappings
100	80	60	28	17	10	5	1-1½ in.	1-1½ in.
110	100	75	30	17½	10	5	1-1½ "	1-1½ "
120	175	130	38	20½	12	6	3-1½ "	3-1½ "
130	225	165	43	20½	12	6	3-1½ "	3-1½ "
140	375	275	43	22¾	15	6	3-2	3-2
150	450	350	49	22¾	15	7	3-2	3-2
160	550	425	45	26¼	18	7	3-2	3-2

